Math 123-01
Summer 2025
Dr. Lily Yen

Assignment 5

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ___/10

Problem 1: A survey is conducted among students and faculty at Capilano University regarding the use of artificial intelligence (AI) for computer science students. Answer the following questions according to the table below. Fill the table as part of your steps.

a. If a person is randomly selected from the survey, what is the probability that the person is for AI in computer science?

b. If a faculty is randomly selected, what is the probability that the faculty is against the use of artificial intelligence for students?

Capilano University Survey

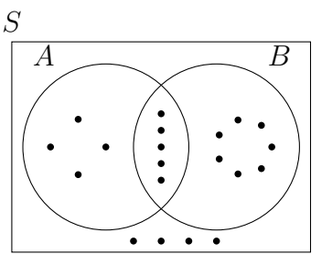
	For AI	Against AI	Total
Students	37	4	41
Faculty	5	7	12
Total	42	11	53

a. $\frac{42}{53} \approx 79.2\,\%$

b. $\frac{7}{12} \approx 58.3\,\%$

Score: /3

Problem 2: Dad drew a big rectangle representing a sample space containing Event A and Event B. Assume that the outcomes (as dots) were all equally likely, give a fraction for each probability question.



a. $P(\overline{A} \cup B)$ $16/20 = 4/5$

b. $P(A \mid \overline{B})$ $4/8 = 1/2$

c. Are A and B mutually exclusive?

No

Score: /3

Problem 3: Assume that 12 % of international visitors arriving at the Vancouver International Airport are sick with the latest variant of Covid. Suppose a Covid test correctly identifies a visitor sick with Covid 90 % of the time. Also assume that the test falsely identifies a healthy visitor as sick with Covid 7 % of the time. If an international visitor tests positive, what is the probability that the visitor is not carrying the virus?

Draw a probability tree as part of your steps.

Tree shown in class. Start the branching with Covid or no Covid before the second branching on test results.

$$P(\overline{C} \mid +) = \frac{P(\overline{C} \cap +)}{P(+)} = \frac{0.88 \times 0.07}{0.12 \times 0.90 + 0.88 \times 0.07} \approx 36.3\,\%,$$

Score: /4